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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/724,670	12/01/2003	Douglas E. Lecrone	EMS-07002	2395

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EXAMINER	
SCHELL, JOSEPH O	
ART UNIT	**PAPER NUMBER**
2114	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/724,670	LECRONE ET AL.	
	Examiner	Art Unit	
	Joseph Schell	2114	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 January 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Detailed Action

Claims 1-18 have been examined.

Claims 1-18 have been rejected.

Claim Objections

1. Claim 4 line 2 should read "one of the primary storage devices" to avoid antecedence ambiguities.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2. Claims 11-18 are rejected under 35 U.S.C. 101 as being nonstatutory. These claims are directed toward computer software and do not explicitly omit nonstatutory embodiments including abstract, unimplemented computer software and software existing in a transmission medium.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-2 and 5-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Glider (US Patent 5,469,453) in view of Ji (US Patent 6,970,987).

4. As per claim 1, Glider ('453) discloses a method of recovering data provided in chunks to a plurality of secondary storage devices, comprising:

for each of the secondary storage devices, discarding data corresponding chunks for which all data thereof has not been received (column 8 lines 17-18, after a write operation (column 8 lines 25-29) data discrepancies are checked and (column 8 lines 32-35) whole stripes are marked as corrupted); and

for each of the secondary storage devices, restoring a chunk of data thereto wherein all of the chunks of data restored to the plurality of secondary storage devices correspond to a particular transmission cycle that provides data to the plurality of secondary storage devices (column 4 lines 3-6, times tamps are used to identify a transmission, column 9 lines 3-4, transmissions of a specific timestamp are expected to match and retransmission is performed on an error. Following retransmission attempts a failure is reported and recovered using a backup tape).

Glider ('453) does not explicitly disclose the system wherein the transmission originates from multiple primary storage devices.

Ji ('987) teaches a system wherein data is transferred from one RAID site to another (column 4 lines 10-14).

At the time of invention it would have been obvious to a person of ordinary skill in the art to implement the robust transfer system disclosed by Glider ('453) in the remote storage system taught by Ji ('987). This implementation would have been obvious because during a write operating a drive can fail to write any data at all. In a RAID 5 architecture a readback of the data would not detect that old data is being accessed in place of the data intended to be accessed (Glider ('453) column 3 lines 6-12).

5. As per claim 2, Glider ('453) in view of Ji ('987) discloses a method, according to claim 1, further comprising: following discarding and prior to restoring, for each of the plurality of secondary storage devices having two different chunks, waiting for external intervention to indicate whether to restore a particular one of the chunks (Glider ('453) column 9 lines 4-10, the disks contain newer and older transmissions. Column 9 lines 12-15, corrective action calls for use of a backup tape. As figure 3 depicts the system, and neither a tape nor a tape-drive is included, they are part of an external system).

6. As per claim 5, Glider ('453) in view of Ji ('987) discloses a method, according to claim 2, further comprising: restoring most recent chunks for all of the plurality of secondary storage devices in response to there being two different chunks associated with all of the plurality of secondary storage devices, wherein a first one of the two chunks corresponds to a first transmission cycle and wherein a second one of the two

chunks corresponding to a different transmission cycle (Glider ('453) column 13 lines 20-27, as a second option, the new data may be reconstructed).

7. As per claim 6, Glider ('453) in view of Ji ('987) discloses a method, according to claim 5, further comprising: discarding chunks that are not restored (Glider ('453) column 9 lines 15-18).

8. As per claim 7, Glider ('453) in view of Ji ('987) discloses a method, according to claim 2, further comprising: for each of the secondary storage devices, restoring a chunk of data corresponding to a particular transmission cycle wherein all of the secondary storage devices contain a chunk of data corresponding to the particular transmission cycle (Glider ('453) column 9 lines 4-15, the blocks have been recovered when they all have the same timestamp corresponding to a transmission).

9. As per claim 8, Glider ('453) in view of Ji ('987) discloses a method, according to claim 7, further comprising: discarding chunks that are not restored (column 9 lines 15-18).

10. As per claim 9, Glider ('453) in view of Ji ('987) discloses a method, according to claim 1, wherein each transmission cycle is assigned a particular tag value that is provided with each chunk of data (Glider ('453) column 3 line 66 through column 4 line 6).

11. As per claim 10, Glider ('453) in view of Ji ('987) discloses a method, according to claim 9, wherein the tag values are used to determine the particular cycle for each of the chunks of data (Glider ('453) column 3 line 66 through column 4 line 6).

12. As per claims 11-12, these claims recite the same limitations as claims 1-2, respectively, and are rejected on the same grounds.

13. As per claims 13-18, these claims recite the same limitations as claims 5-10, respectively, and are rejected on the same grounds.

14. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Glider ('453) in view of Ji ('987) and in further view of Burns (US Patent 6,088,694).

Glider ('453) in view of Ji ('987) discloses the method according to claim 2 wherein the external intervention is provided by a host computer (Glider ('453) column 9 lines 14-15, a controller is required to interface with a tape drive). Glider ('453) in view of Ji ('987) is silent as to whether this host containing the backup tape storage is proximate to at least one of the secondary storage devices.

Burns ('694) teaches a database system employing delta versioning and backing up of files (see abstract). In the system taught by Burns ('694) backup storage is stored proximate to the data is its serving as recoverable backup for (as shown in figure 6).

At the time of invention it would have been obvious to a person of ordinary skill in the art to modify the system disclosed by Glider ('453) in view of Ji ('987) such that the tape storage used to recover from unrecoverable errors is located close to the storage device for which it is serving as a recoverable backup as taught by Burns ('694). This modification would have been obvious because updates to the backup storage are done frequently, with every data append operation (Burns ('694) column 12 lines 24-30) and data update operation (Burns ('694) column 13 lines 28-33).

15. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Glider ('453) in view of Ji ('987) and in further view of Malcolm (US Patent 5,086,502).

Glider ('453) in view of Ji ('987) discloses the method according to claim 2 wherein the external intervention is provided by a host computer (Glider ('453) column 9 lines 14-15, a controller is required to interface with a tape drive). Glider ('453) in view of Ji ('987) is silent as to whether this host containing the backup tape storage is proximate to at least one of the secondary storage devices.

Malcolm ('502) teaches a system that stores a backup copy of write operations being performed on a storage (see abstract).

At the time of invention it would have been obvious to a person of ordinary skill in the art to modify the system disclosed by Glider ('453) in view of Ji ('987) such that the tape storage used to recover from unrecoverable errors is located close to the storage where the data is originating and copying the write operations of the primary system. This modification would have been obvious because it allows total protection against data loss because it automatically (Malcolm ('502) column 1 lines 32-34) updates the stored image (Malcolm ('502) column 1 lines 37-41).

Conclusion

The prior art made of record on accompanying PTO 892 form and not relied upon is considered pertinent to applicant's disclosure. Specifically, Ofek ('327) teaches data transfers between storage devices using write buffers, write logs and update timestamping, and Kamvysselis ('292) teaches data transfers between storage devise using write buffers and an acknowledgement protocol.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Schell whose telephone number is (571) 272-8186. The examiner can normally be reached on Monday through Friday 9AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Scott Baderman can be reached on (571) 272-3644. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JS

SCOTT BADERMAN
SUPERVISORY PATENT EXAMINER